

UC SAN DIEGO NANOENGINEERING SEMINAR

Wednesday, June 12, 2019

Seminar Presentation: 11:00am - 12:00pm

SME 248

“Engineering Nanomaterials for Molecular Imaging and Chemoradiation”

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Abstract: Nanomaterials have attracted significant attention for their potential to revolutionize biomedical applications due to their unique properties and ability to function at the scale of biomolecular interactions. Of particular interest, nanoparticle-based drug delivery and molecular imaging platforms have the potential to radically change the way we diagnosis and treat diseases, such as cancer. The first nanotechnology-based cancer drugs, including Doxil[®] and Abraxane[®], have already made their way into the clinic with many more in the pipeline. In addition, luminescent imaging probes, such as quantum dots and fluorescent dye-doped silica, have already shown great impact as tools in preclinical cancer research and have begun evaluation in human clinical trials. In this talk, I will discuss two novel tumor-targeted nanoplatforms for potential applications in clinical oncology. In the first, I will focus on the use of multifunctional nanoparticles to enable image-guided therapies for brain tumors. In this work, a combined magnetic and optical functional nanoparticle with high specificity for tumor cells was developed to allow for pre-surgical planning by MRI, real-time fluorescence-guided tumor resection, and drug delivery. In the second application, I'll describe how a novel class of nanoparticles, which possess radioluminescent properties, enable a new hybrid imaging modality with unique advantages over current nuclear medicine techniques, such as PET/CT. Finally, I will briefly discuss the development of theranostic nanoplatforms which couple these nanoprobles to therapeutic applications, such radiation dose enhancement and drug delivery.

Biosketch: Conroy Sun is an assistant professor in the Department of Pharmaceutical Sciences at Oregon State University. Dr. Sun is also an affiliate assistant professor of Radiation Medicine and affiliate member of the Knight Cancer Institute at OHSU. He received his Ph.D. from the University of Washington's Nanotechnology dual-degree program in 2008 under the mentorship of Dr. Miqin Zhang. He holds a B.S. in Materials Science and Engineering also from UW. Dr. Sun's postdoctoral training was completed at Stanford University in the Department of Radiation Oncology, which was funded by a DOD CDMRP Breast Cancer Research Program Fellowship. Currently, his lab is located on Portland's South Waterfront in the Robertson Life Sciences building. Dr. Sun's recent work focuses on developing nano- and biomaterials for applications in drug delivery and molecular imaging. In particular, his lab interested in improving the efficacy of chemoradiation and radiation therapy through the use of a variety of nanomaterials. Dr. Sun's interdisciplinary work in nanomedicine, molecular imaging, and drug delivery has been reported in over 40 peer-reviewed articles.